REMARKS

Reconsideration and allowance in view of the foregoing amendments and the following remarks are respectfully requested. By this Amendment, claims 1, 4, 5, 13, and 21 have been amended to merely clarify the recited invention without the intention of narrowing the scope of the claims. No new matter has been introduced. Claims 1-21 are now pending.

The present invention relates to method and system for aiding a machinist in preparing a programmed machine for a machining process. A machinist first inputs machining information. A tool data memory stores a tool data file or tool information. A basic program is generated based on the input machining information from the machinist and the tool information. The basic program is executed to derive the values of various machining variables using the input machining information and the tool information. Such derived machining variable values (instead of the input machining information from the machinist) are then used in analyzing the efficiency of the machining process and an advisory message is selected based on the analyzed efficiency. The machinist is notified of the advisory message, which provides information related to how to improve the basic program to enable the machining process to achieve the highest speed allowed. The machinist may then modifies the basic program according to the advisory message to obtain a final machining program. In the present invention, the values of the machining variables are automatically derived during the execution of the basic program. In addition, the efficiency analysis is performed based on such automatically derived machining variable values instead of input machining information manually entered by the machinist.

In response to the Examiner's argument in Section 4 of the Office Action, dated July 31, 2002, the paragraph starting on page 43, line 26 has been changed. Word

"judges" has been changed to "judged" at line 14 on page 44. Other wording changes are also made merely for clarification.

In response to the Examiner's argument in Section 5 of the Office Action, claim 5 has been amended to provide antecedent basis for the limitation recited in claim 5.

Claims 1 and 21 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Fishman (U.S. Patent No. 6,112,133) in view of Kahn et al. (U.S. Patent No. 4,866,635). This rejection is respectfully traversed. The combination of Fishman and Kahn fails to teach or suggest all the features recited in rejected claims 14-20.

The amended claim 1 clarifies the relationship among the input machining information, the values of machining variables, and the efficiency analysis. Claim 1 recites a basic program that is created based on input machining information entered by a machinist as well as tool information stored in a tool data memory. The basic program is executed to derive the values of various machining variables, which are subsequently used to analyze the efficiency of the machining process. Based on the efficiency analysis, an advisory message is notified to the machinist in terms of how to improve the basic program to obtain a final machining program that enables the machining process to perform at the highest speed allowed by the underlying machine. The final machining program is therefore derived by improving the basic program according to the advisory message.

According to the amended claim 1, the input machining information differs from the machining variables. In addition, the tool information is different from the machining variables. The input machining information is from the machinist and the tool information is stored in a tool data memory. The values of the machining variables are derived by the basic program during its execution. Fishman discloses a visual system for generating a CNC program for machining parts. As correctly pointed out by the Examiner, in

Fishman's system, part machining information serves as input used to prepare a machining program. The part machining information in Fishman's teaching corresponds to the input machining information recited in claim 1. But, the part machining information does not correspond to the machining variables in the claimed invention. As stated earlier, the values of the machining variables in the present invention are derived automatically during the execution of the basic program. In addition, Fishman teaches an optimization module that analyzes efficiency based on the part machining information. In the claimed invention, it is not the input machining information that is used in efficiency analysis. Rather, it is the values of the machining variables derived by the basic program during its execution that are used in efficiency analysis. Furthermore, Fishman does not teach about an advisory message to the machinist. The output from Fishman's system is a default machining program prescribing a sequence of operations formed based on part machining information.

Furthermore, with the claimed invention, the machinist may simply follow the advisory message to improve the basic program without needing special knowledge or experience. The improvement recommended in the advisory message ensures the highest speed allowed by the underlying machine. According to Fishman, an operator may modify a standard chart by graphically dragging the points on the chart to suit operator's experience (column 7, lines 13-15). Experience is required to perform the modification. In addition, such modification does not guarantee that the underlying machining process is to be performed at the highest speed allowed by the capacity of the underlying machine. Therefore, Fishman does not disclose, teach, or fairly suggest the same as what is claimed in claims 1.

Kahn et al. does not remedy the above mentioned deficiencies. Kahn et al. discloses, as correctly pointed out by the Examiner, merely an expert system for selecting

the best repair procedure. It does not teach generation of the values of various machining variables via a basic program, established based on the machinist's input machining information and tool information, and the use of such generated machining variables to perform efficiency analysis so that a suitable advisory message can be selected to guide the machinist to improve the basic program to generate a final machining program enabling the best utilization of the underlying machine.

Therefore, the Applicant respectfully requests that the rejection of claim 1 under 35 U.S.C. §103(a) be withdrawn. Claim 1 is now patentable over the combination of Fishman and Kahn et al.

The amended claim 21 contains features similar to those claimed in claim 1. As stated above, Fishman does not teach or suggest a means to derive the values of machining variables during the execution of a basic program, use such derived values to perform efficiency analysis, select an advisory message according to the efficiency analysis, and notify the machinist to improve the basic program to enable the machining program to achieve the highest speed allowed by the underlying machine, as recited in claim 1. Kahn et al. fails to remedy the deficiencies of Fishman.

Therefore, the Applicant respectfully requests that the rejection of claim 21 under 35 U.S.C. §103(a) be withdrawn. Claim 21 is now patentable over the combination of Fishman and Kahn et al.

Claim 13 has been rejected under 35 U.S.C. §103(a) over Fishman (U.S. Patent No. 6,112,133) in view of Kahn (U.S. Patent No. 4,866,635). The rejection is respectfully traversed. The combination of Fishman and Kahn fails to teach or suggest all the features recited in rejected claim 13.

Amended claim 13 contains features similar to those claimed in claim 1. As stated above, Fishman does not teach or suggest a means to derive values of machining variables

during the execution of a basic program, use such derived values to perform efficiency analysis to select an advisory message, and to notify the machinist to improve the basic program to enable the machining program to achieve the highest speed allowed by the underlying machine, as recited in claim 1. Kahn et al. fails to remedy the deficiencies of Fishman.

Therefore, the Applicant respectfully requests that the rejection of claim 13 under 35 U.S.C. §103(a) be withdrawn. Claim 13 is now patentable over the combination of Fishman and Kahn et al.

Claims 2-12 have been rejected under 35 U.S.C. §103(a) over Fishman (U.S. Patent No. 6,112,133) in view of Kahn (U.S. Patent No. 4,866,635). The rejection is respectfully traversed. The combination of Fishman and Kahn fails to teach or suggest all the features recited in rejected claims 2-12.

Claim 2-12 depend from claim 1 and, as stated above, Fishman does not teach or suggest a means to derive values of machining variables during the execution of a basic program, use such derived values to perform efficiency analysis to select an advisory message, and to notify the machinist to improve the basic program to enable the machining program to achieve the highest speed allowed by the underlying machine, as recited in claim 1. Kahn et al. fails to remedy the deficiencies of Fishman.

Consequently, claims 2-12 are patentable at least for the reasons stated above with respect to claim 1 and for the addition features recited therein. Therefore, the Applicant respectfully requests that the rejection of claims 2-12 under §103 be withdrawn.

Claims 14-20 have been rejected under 35 U.S.C. §103(a) over Fishman (U.S. Patent No. 6,112,133) in view of Kahn (U.S. Patent No. 4,866,635). The rejection is respectfully traversed. The combination of Fishman and Kahn fails to teach or suggest all the features recited in rejected claims 14-20.

Claim 14-20 depend from claim 13 and, as stated above, Fishman does not teach or suggest a means to derive values of machining variables during the execution of a basic program, use such derived values to perform efficiency analysis to select an advisory message, and to notify the machinist to improve the basic program to enable the machining program to achieve the highest speed allowed by the underlying machine, as recited in claim 13. Kahn et al. fails to remedy the deficiencies of Fishman.

Consequently, claims 14-20 are patentable at least for the reasons stated above with respect to claim 1 and for the addition features recited therein. Therefore, the Applicant respectfully requests that the rejection of claims 14-20 under §103 be withdrawn.

In view of the foregoing, the claims are in form for allowance, and such action is hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the telephone number listed below.

Attached hereto as an attached Appendix captioned **"Version with markings to show changes made"** is a marked-up version of the changes made to the claims by the current amendment.

All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance and a notice to that effect is earnestly solicited.

Respectfully submitted,

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Enclosure: Appendix

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please change the paragraph starting on page 43, line 26 to the following:

The machining navigation apparatus 2 according to the present invention is employed to aid the composition of a machining program PRO in a machining center 1. However, the present invention may also be applied to other types of machine tools, such as a lathe, an electric discharge machine, and a laser cutting machine to aid the composition of a machining program. In such cases, the contents and values of the [values of] machining variables HJ (e.g., maximum spindle load, the cutting speed of the cutting tool, and the spindle rotating speed) are changed in accordance with the type of machine. For example, the values of machining variables HJ may include the spindle rotating speed and the spindle load in lathes, the distance between electrodes and the voltage load in electric discharge machines, and the voltage load in laser cutting machines. Furthermore, the parameters mentioned above [that are referred to judge the machining efficiency] may be [judges] judged [by referring] with respect to a referenced spindle load limit value in lathes[,] and a voltage load limit value in electric discharge machines and laser cutting machines. The contents of the navigation information that appears on the display may also be changed in accordance with the machine.

IN THE CLAIMS:

Please amend the following claims:

1. (Amended) An apparatus for aiding a machinist in preparing a programmed machine for a machining process, wherein a basic program for performing the machining

process is generated based on machining information input from the machinist and tool information stored in a tool data memory [run for setting values of various machining varaibles based on information input by the machinist], the apparatus comprising:

a computer for executing the basic program to obtain values of various machining variables;

an analyzing means for analyzing the variable values obtained during the execution of the basic program to determine the efficiency of the machining process; and

a notifying means for notifying the machinist an advisory message [to the machinist] regarding [on] how to improve the [machining process] basic program to generate a final machining program that enables the machining process to perform at the highest speed allowed by the capacity of the machine [in accordance with] based on the analysis performed by the analyzing means so that the final machining program is generated by improving the basic program according to the advisory message.

4. (Amended) The apparatus according to claim 1, further comprising a navigation information memory for storing a plurality of messages, wherein the notifying means selects a message from the navigation information memory in accordance with the analysis performed by the analyzing means and notifies the machinist the selected message.

5. (Amended) The apparatus according to claim 1, wherein the machining process is one of a plurality of machining processes, wherein the basic program is [run] executed to [for setting] obtain the values of machining variables for [a plurality of] the machining processes, wherein the apparatus comprises an input device for designating [a certain] one of the machining processes, and wherein the analyzing means analyzes the

machining variables of the designated machinng process.

13. (Amended) An apparatus for aiding a machinist in preparing a programmed machine for a plurality of machining processes, wherein a basic program for performing the machining processes is generated based on machining information input from the machinist and tool information stored in a tool data memory [run for setting values of various machining variables based on information input by the machinist], the apparatus comprising:

a computer for [running] executing a machining simulation [program] for simulating the machining processes according to the basic program to obtain values of various machining variables;

an input device for designating a certain machining process;

an analyzing means for analyzing the machining variables of the designated machining process to determine the machining efficiency of [that] the designated machining process;

a navigation information memory for storing a plurality of messages that [give] provide advice to the machinist regarding [on] how to [improve machining] enable each of the machining processes to achieve the highest speed allowed by the capacity of the machine; and

a display means for selecting a message from the navigation information memory [in accordance with] based on the analysis performed by the analyzing means and displaying the selected message so that a final machining program is generated by improving the basic program according to the selected message.

21. (Amended) A method for aiding a machinist in preparing a programmed

machine for a machining process, wherein a basic program for performing the machining processes is generated based on machining information input from the machinist and tool information stored in a tool data memory [run for setting values of various machining variables based on information input by the machinist], the method comprising:

executing the basic program to obtain values of various machining variables;

analyzing the current values of the machining variables obtained during the execution of the basic program to determine the [current] efficiency of the machining process; and

notifying the machinist an advisory message [to the machinist] regarding [on] how to improve the [machining process] basic program to generate a final machining program that enables the machining process to perform at the highest speed allowed by the capacity of the machine [in accordance with] based on the analysis performed by the analyzing so that the final machining program is generated by improving the basic program according to the advisory message.